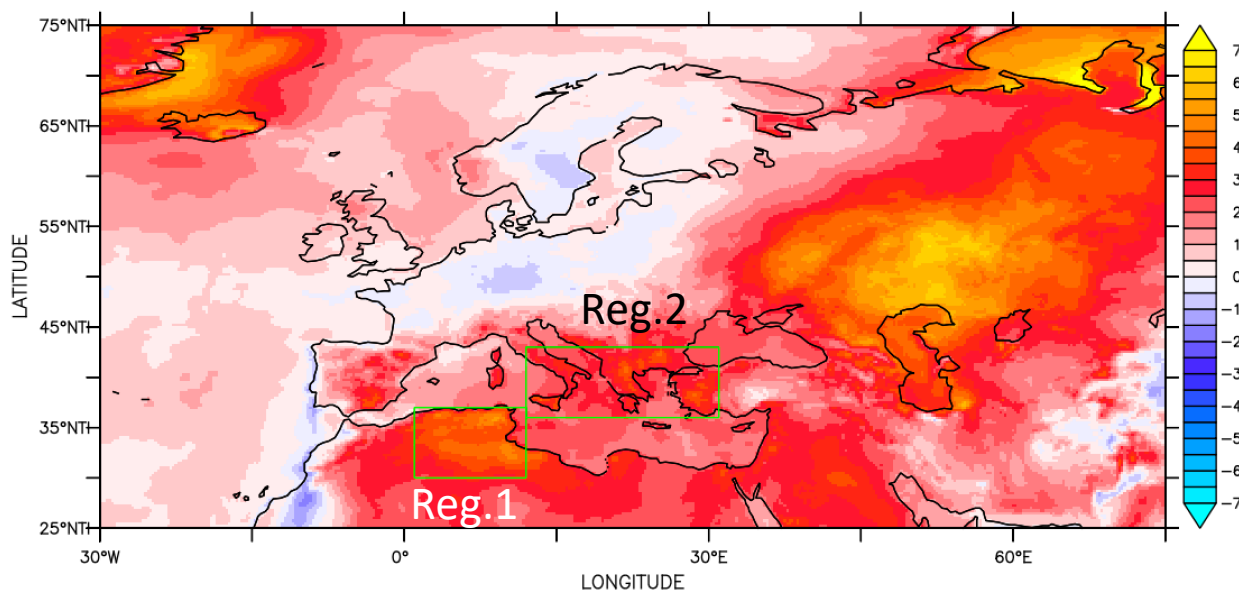


Dynamics and attribution of exceptional Mediterranean heatwave in August 2021

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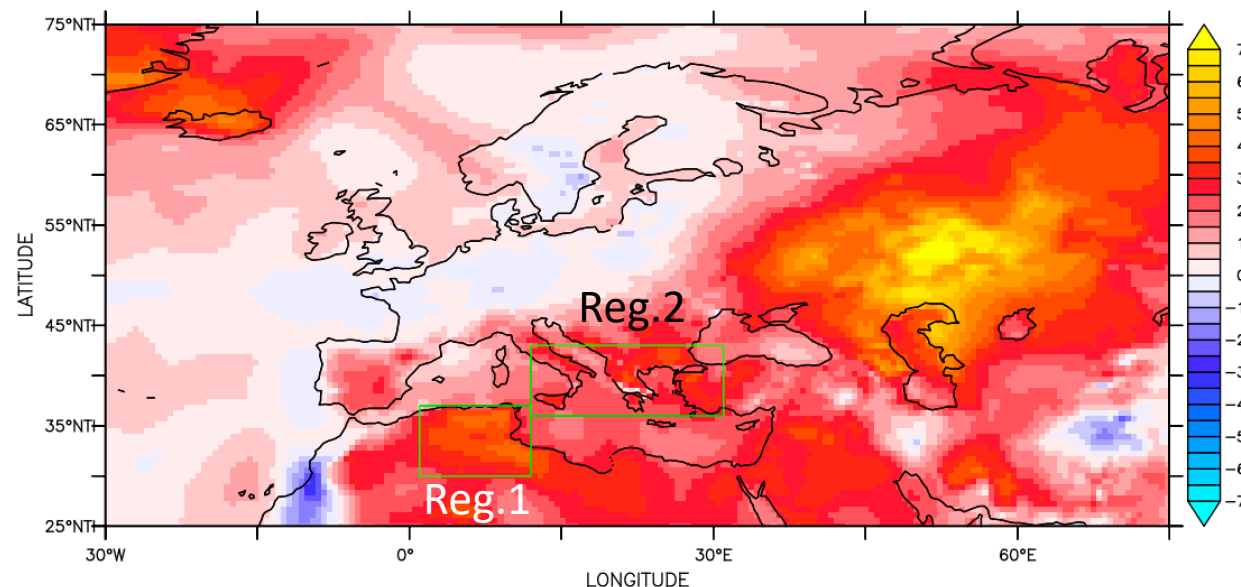
→ in August 2021 exceptional extreme heat affected a broader Mediterranean region
(including 48.8 °C in Syracuse, Italy, and 50.3 °C in Kairouan, Tunisia, on 11 August)

ERA5 Aug 2021 2m T_a (w.r. 1961-1990 clim.) [°C]

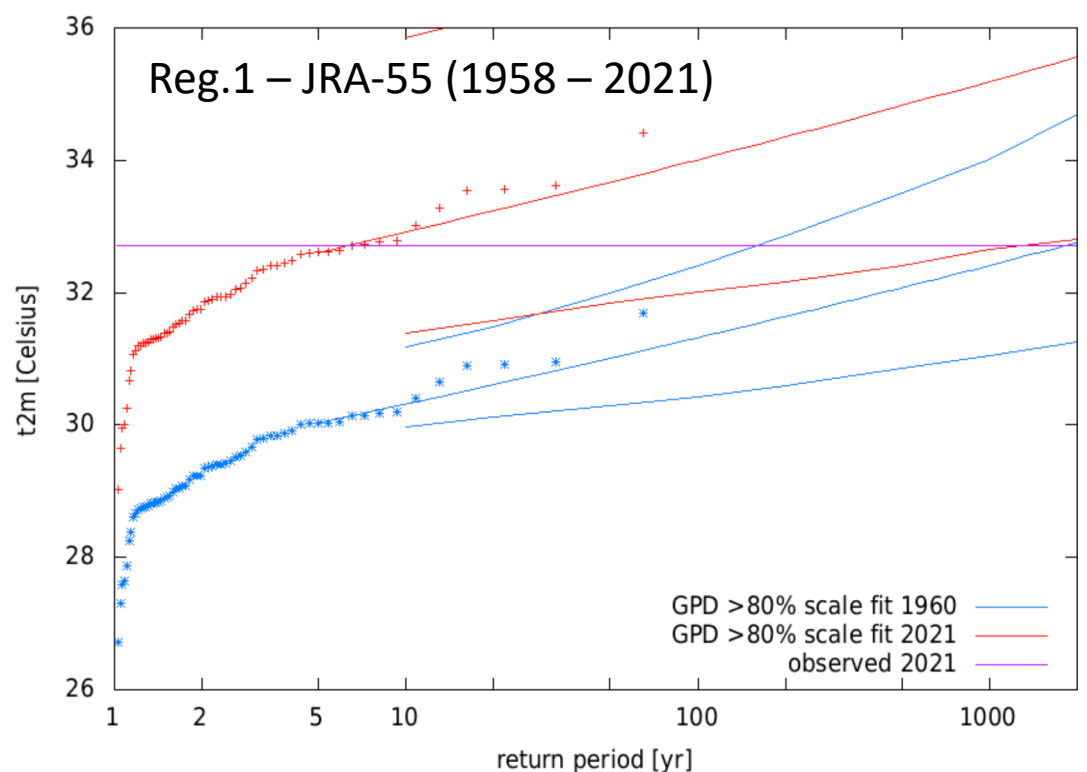
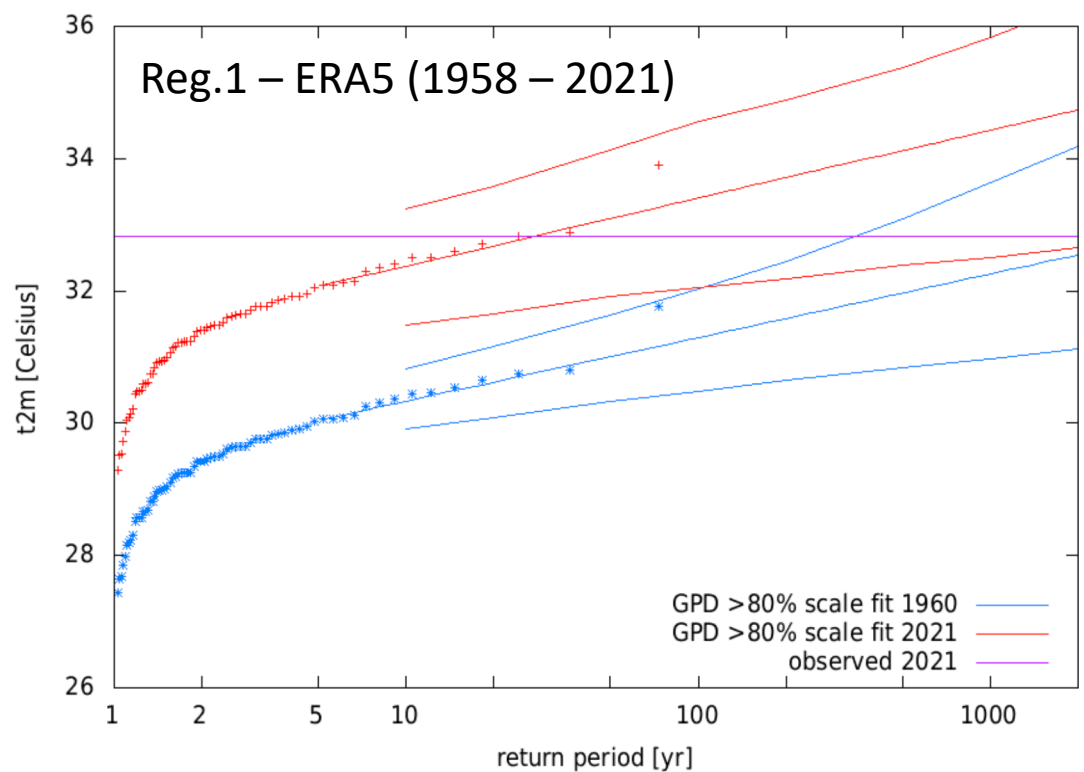
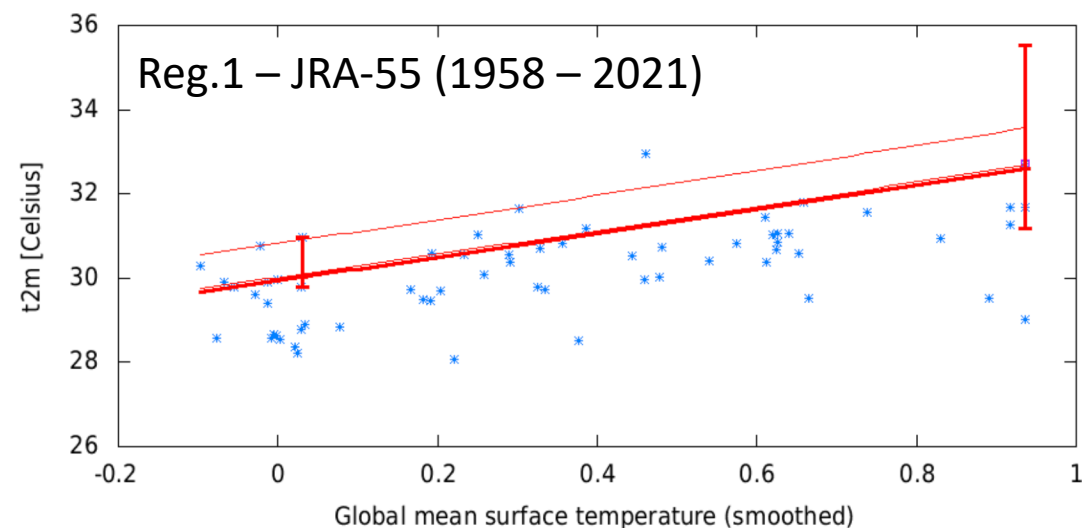
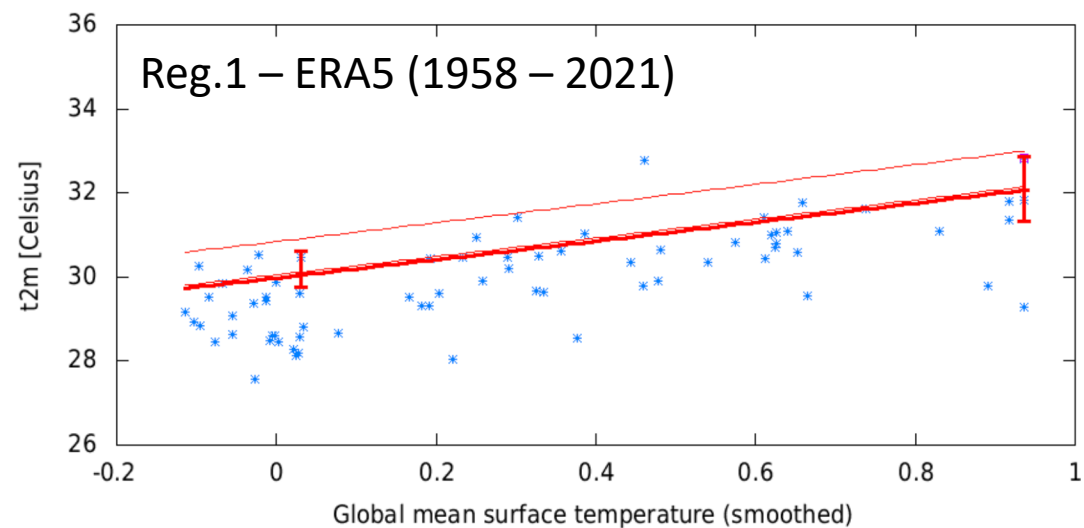


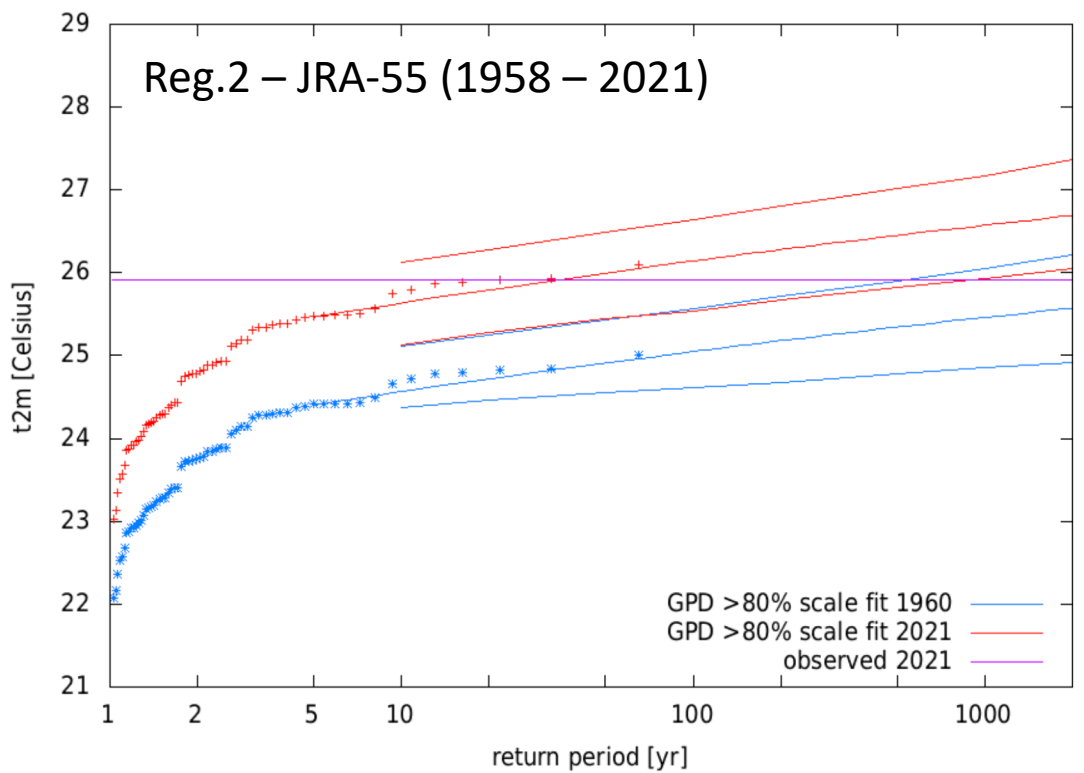
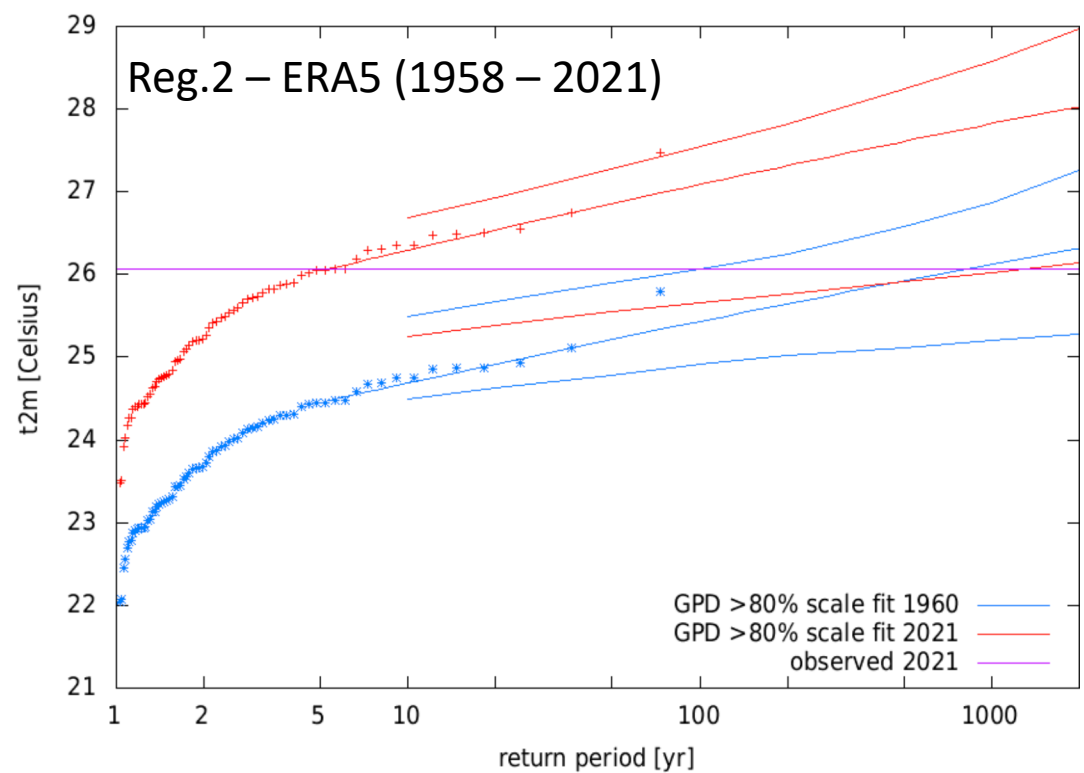
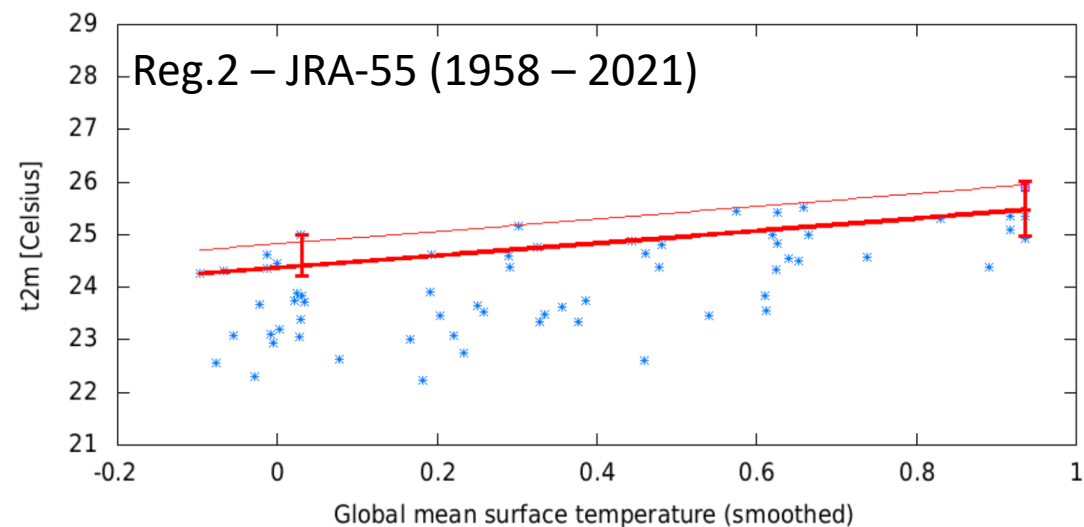
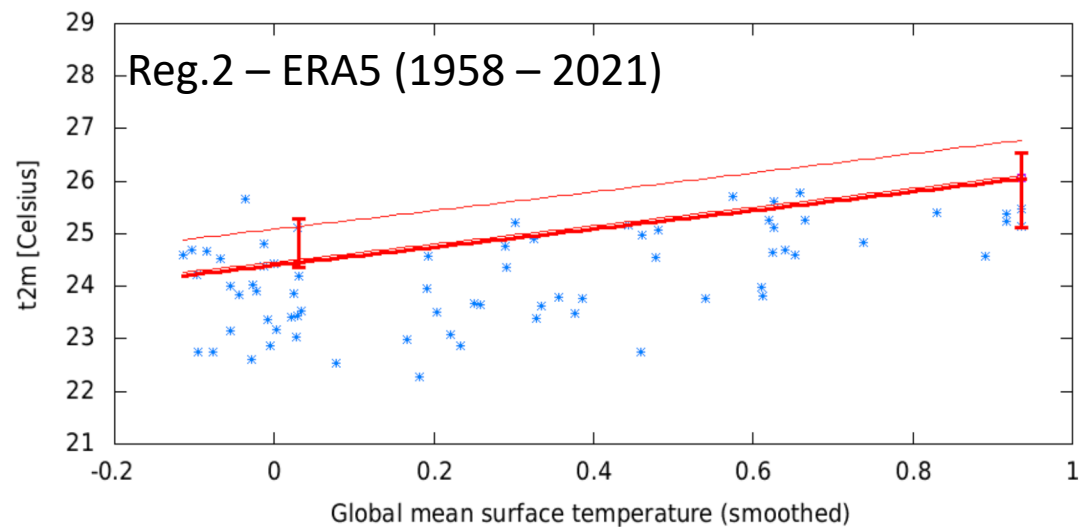
ECMWF (0.25° x 0.25°) ERA5

JRA-55 Aug 2021 2m T_a (w.r. 1961-1990 clim.) [°C]



JMA (0.56° x 0.56°) JRA-55





• **2021 vs 1960:** Propability (risk) ration = **PR**,

PR (Reg.2, ERA5) = **141.3** (95% CI: 4.6; ∞)

ΔT (Reg 2,ERA5) = **6.7** (95% CI: 2.6; 10.9)%

PR (Reg.3, ERA5) = **155.8** (95% CI: 0.2; ∞)

ΔT (Reg 3, ERA5) = **6.5** (95% CI: -1.1; 8.4)%

Temperature (intensity) change = ΔT

PR (Reg.2, JRA-55) = **287.9** (95% CI: 2.4; 2×10^5)

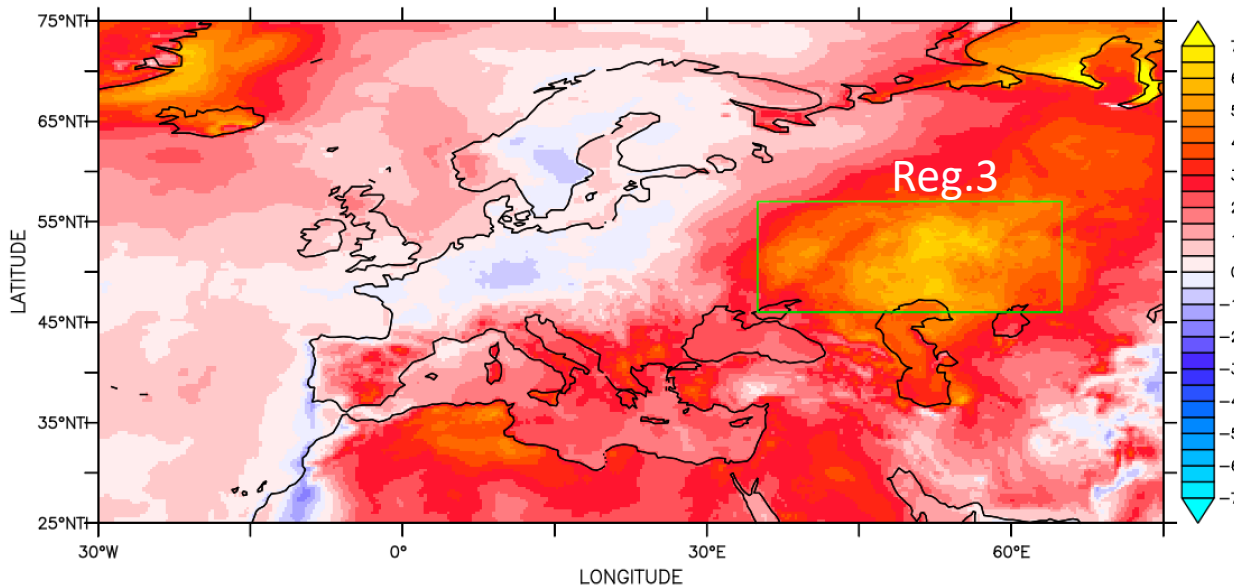
ΔT (Reg 2,JRA-55) = **8.6** (95% CI: 1.3; 18.0)%

PR (Reg.3, JRA-55) = **608.2** (95% CI: 1.5; ∞)

ΔT (Reg 3, JRA-55) = **4.4** (95% CI: 0.3; 7.0)%

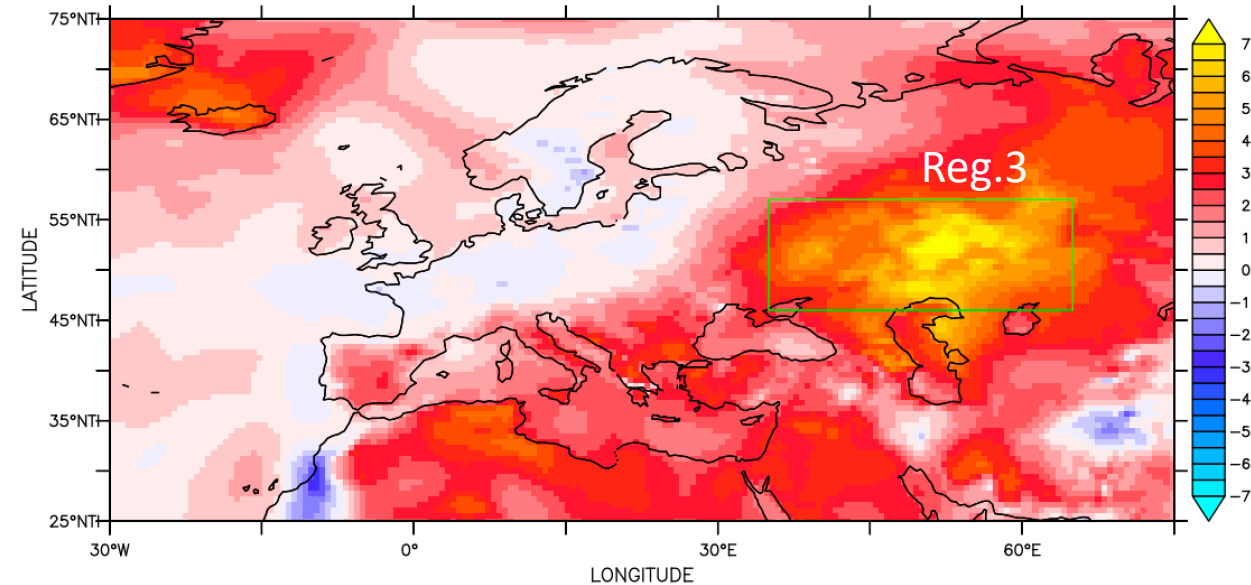
→ What about that anomalously high SAT over the Caspian Sea?

ERA5 Aug 2021 2m T_a (w.r. 1961-1990 clim.) [$^{\circ}\text{C}$]

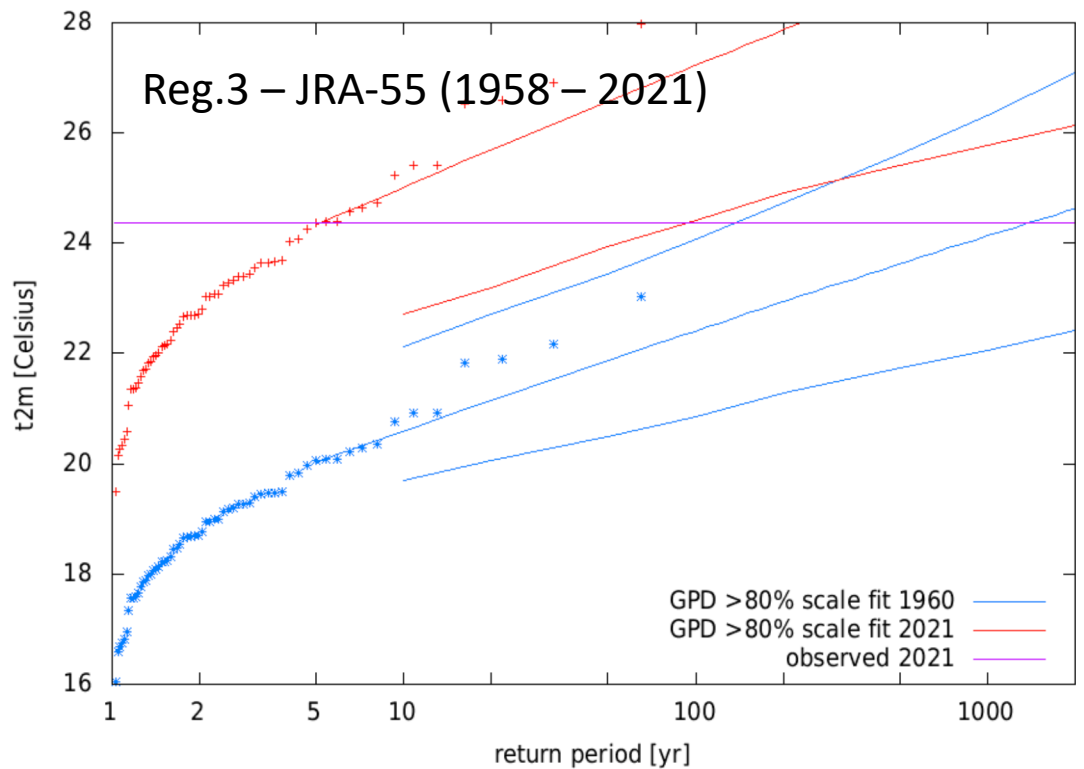
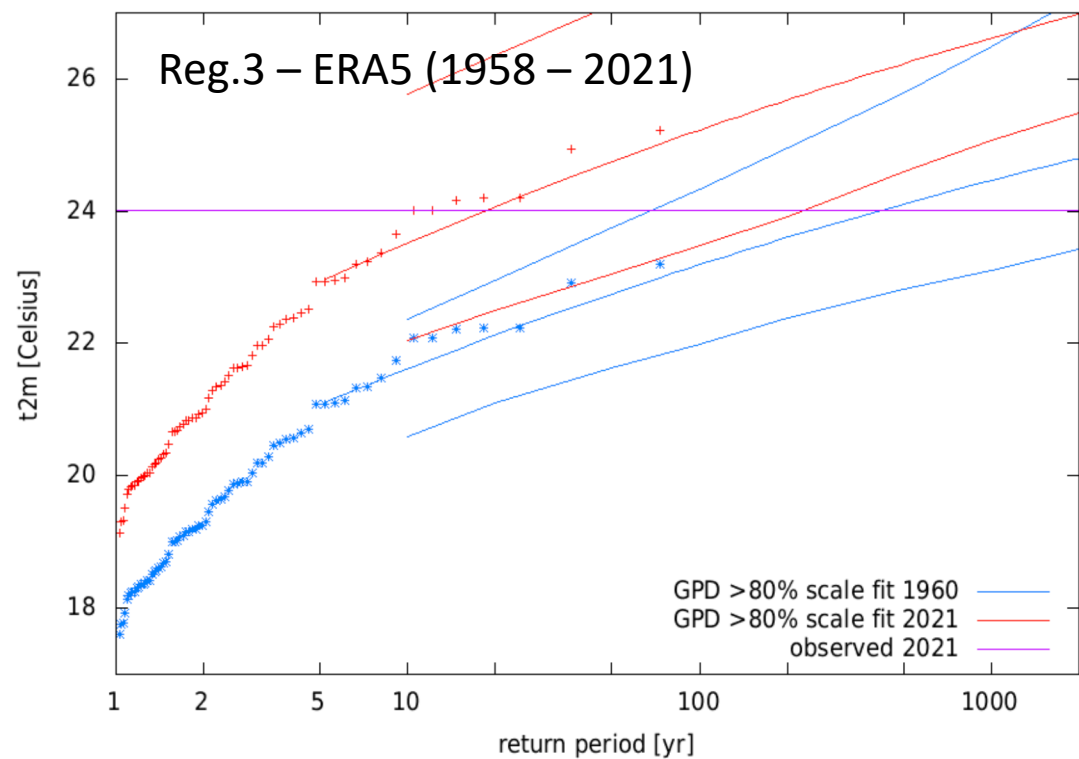
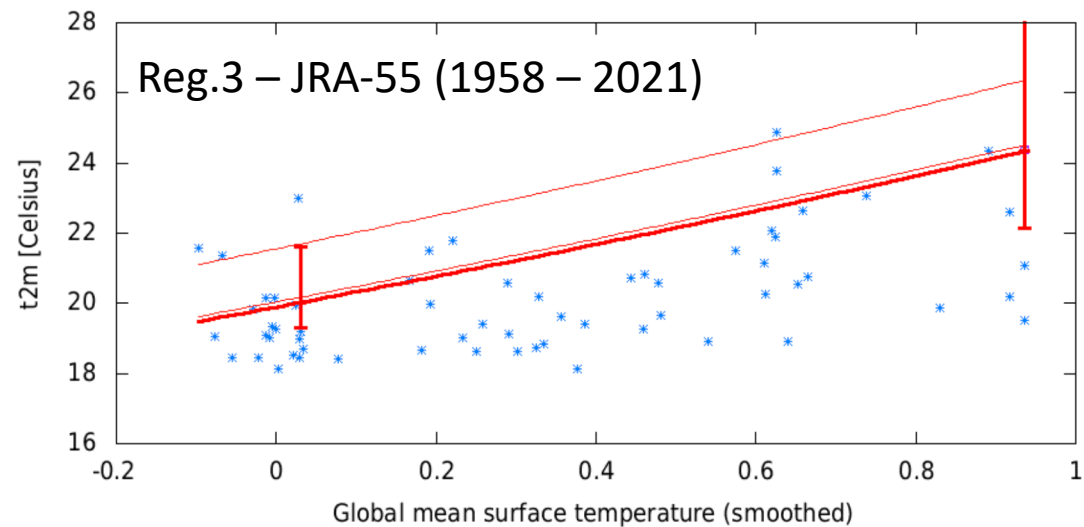
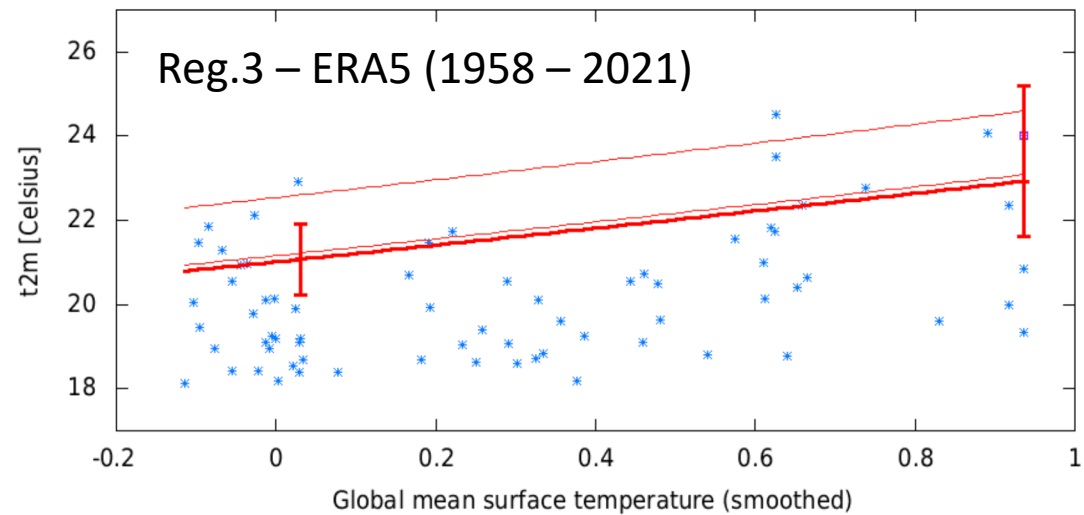


ECMWF (0.25 $^{\circ}$ x 0.25 $^{\circ}$) ERA5

JRA-55 Aug 2021 2m T_a (w.r. 1961-1990 clim.) [$^{\circ}\text{C}$]



JMA (0.56 $^{\circ}$ x 0.56 $^{\circ}$) JRA-55



• **2021 vs 1960:** Propability (risk) ration = **PR**,

PR (Reg.3, ERA5) = **22.6** (95% CI: 0.9; 1660.8)

ΔT (Reg 3,ERA5) = **8.8** (95% CI: -0.1; 21.3)%

Temperature (intensity) change = ΔT

PR (Reg.3, JRA-55) = **267.8** (95% CI: 2.3; 8.6×10^5)

ΔT (Reg 3,JRA-55) = **21.5** (95% CI: 3.1; 54.4)%

⇒ Global climate change from 1960 to 2021 has made such August conditions **about 200 more likely in Region 1**, and **about 400 more likely in Region 2**

⇒ There is clear need to take climate change forcing factors into account for future disaster risk management, resilience strengthening and adaptation planning (health, agriculture, ...) in the Mediterranean region (and beyond)

→ Stay tuned for a paper on these integrated multi-method results, associated circulation characteristics, ...

Questions, comments,